



# SMT359

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## Introduction and Guide

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Welcome to SMT359 *Electromagnetism*. We hope you will find this module interesting, useful, challenging and enjoyable.

### READ THIS FIRST

This Guide should be the first SMT359 document you read. In it we outline the aims of the module, and provide details of the learning materials, the website, tuition and assessment arrangements, and whom to contact if you have queries.

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# I General aims of SMT359

An understanding of the concepts of electromagnetism, and the ability to apply them, is important in many areas of science and technology. So a major aim of this module is to develop this understanding and to equip you with the skills to apply it.

Underpinning the whole theory of electromagnetism is a set of four equations, known as Maxwell's equations, shown here on the T-shirts worn by the editors of the three books.



The aim of Book 1 is to introduce these equations one by one, emphasizing the significance of each of them and showing how they can be applied. The second and third books will broaden and deepen your understanding of Maxwell's equations by applying them to a diverse range of phenomena. In particular, Book 3 applies Maxwell's equations to electromagnetic waves and explains many properties of light and radio waves.

The language of mathematics is essential for a deep understanding of electromagnetism and for solving electromagnetic problems. And conversely, seeing how mathematical techniques are applied to real-life problems in science should deepen your understanding of mathematics and enhance your skills in applying it. So an important aim of the module is to exploit the synergy between the physics and the mathematics to enhance your understanding of both of them.

Finally, one of the reasons that electromagnetism is important and interesting is that it affects so many areas of science and technology. We aim to give you an appreciation of its ubiquity by presenting examples ranging from particle accelerators to electronic devices, from auroras to medical imaging, and from astrophysics to optical fibres.

## 2 Assumed prior knowledge

When preparing SMT359, we made certain assumptions about your knowledge and understanding of physics and mathematics. If you have good passes (at Grade 3 or above) in the OU modules S207 *The Physical World* and MST209 *Mathematical methods and models* you should be suitably prepared.

We assume that you will be familiar with basic mechanics (particularly Newton's laws, uniform acceleration, circular motion, work and energy, the relationship between force and potential energy, and properties of waves). Some knowledge of electromagnetism at the level of the treatment in S207 would be an advantage, though the

important electromagnetism concepts are all introduced in SMT359. You should also be fluent in algebraic manipulation, vector algebra, differentiation and integration, and should have some familiarity with partial differentiation, differential equations, multiple and line integrals, vector calculus and complex numbers. In particular, your ability to use vectors and vector calculus will make a great difference to how straightforward you find this module. In fact the *Mathematical Toolkit* in the first of the three SMT359 books (see Section 3.1. below) describes the mathematics you need to know to study SMT359.

If you are not confident that you are suitably prepared, we strongly advise that you work through the questions in the *Are you ready for SMT359?* booklet, which can be downloaded from the SMT359 website (accessible from your StudentHome page) or from the Science Faculty website <http://www.open.ac.uk/science/> (click on *Courses & Qualifications* and then *Are You Ready for Science*).

The booklet has suggestions for materials that you can study to fill any gaps in your knowledge or skills. Prior to allocation to a tutor, you should contact a member of the Physical Science Student Support Team (see page 5). if you are unsure about your preparedness for SMT359. You should also discuss any concerns with your tutor as soon as you can.

## 3 Learning materials

The learning materials for SMT359 include three books and two accompanying DVDs, plus a *Glossary* of terms used in the module.

### 3.1 Books

The main printed material is presented in three books, which are sent to you at the start of the module.

**Book 1**, *An introduction to Maxwell's equations*, brings together most of the key concepts of electromagnetism that are used in SMT359. Starting with basic ideas of electric charge and current, it develops an understanding of the important concepts of electric and magnetic fields, and shows how they are related by Maxwell's four equations. The culmination of the book is the demonstration that Maxwell's equations lead to the prediction of the existence of electromagnetic waves, and the identification of light as part of a spectrum of electromagnetic waves that stretch from short-wavelength gamma rays and X-rays through to longer-wavelength microwaves and radio waves. The last part of the book consists of a *Mathematical Toolkit* which reviews the areas of mathematics that are needed to interpret and understand Maxwell's equations. If you feel that mathematics is a major obstacle you may prefer to read this part before the main part of the book.

**Book 2**, *Electromagnetic fields*, shows how electric and magnetic fields are modified in the presence of electrically conducting and insulating materials and magnetic materials. It equips you with a range of tools and techniques for determining the fields and forces due to various arrangements of charge or current. Later chapters of the book are concerned with the forces that are experienced by charges in the presence of electric and magnetic fields, and energy storage in electric and magnetic fields. The book concludes with a chapter on superconductivity and a discussion of the insights that the theory of special relativity gives to the relationship between electric and magnetic fields.

**Book 3**, *Electromagnetic waves*, explores solutions to Maxwell's equations that correspond to electromagnetic waves, and uses a simple model to demonstrate how such waves can be generated by oscillating currents. By considering the propagation of electromagnetic waves in different materials and what happens to the waves at boundaries between materials, we are able to show that Maxwell's equations can explain many results of optics, such as the laws of reflection and refraction, and can explain why the sky is blue and why light from the sky is polarized. Later chapters explore electromagnetic waves in plasmas (the ionized gases found in the ionosphere, in stars and in interstellar space), and discuss how the interaction of light with the cornea of the eye accounts for its transparency, in contrast to the opaqueness of other biological tissues.

**E-text** The three books will be accessible in e-text format on the SMT359 website. The e-text will be searchable, so you can find the references to any term of interest, e.g. *Lorentz force*. We do not expect you to print out large sections of the book, though there may be occasions when printing a chapter to take to study on a beach, for example, is a better option than taking one of the books.

**Worked examples and exercises** The books contain numerous worked examples and exercises, and these should play an important part in your learning. The worked examples illustrate important skills, and should be studied where you meet them in the text. Tackling the exercises is also a vital part of the learning process, since this allows you to gauge your understanding of the text and prepare for assignments. We recommend that you try the exercises when you meet them in the text.

**Reference material inside covers** Inside the front cover of each book we have printed Maxwell's equations and a number of other physics equations for easy reference, together with values of frequently used physical constants and conversions between units of physical quantities. Inside the back cover you will find important mathematical relationships. Some of these equations and relationships will not be particularly meaningful at the start of the module, or even after you have studied the first two books. But by the time you complete the module you should be familiar with all of them. You will find this reference material invaluable when tackling the exercises and assignment questions.

## 3.2 DVDs

The two DVDs for SMT359 contain software and video material. There are five software activities, which are designed to reinforce your understanding of Maxwell's equations. We recommend that you study these when you are studying Book 1, though they will also be useful for revision later on. Two of the video sequences involve a tutor discussing assignment questions with a student; these should be watched before tackling the first assignment, TMA 01. The other video sequences were made for the predecessor module, SMT356, but should also provide useful support for SMT359. The SMT359 *Study Planner* indicates recommended times to study the software and video resources.

## 3.3 Glossary

The SMT359 *Glossary* contains concise definitions of terminology used in the module. It is intended to be a handy source of reference while studying the books, and should also be useful for revision. An electronic version of the *Glossary*, with links between related terms, will be accessible from the website.

# 4 Website

The SMT359 website (accessible from your StudentHome page) is an important source of information and resources, and these will be added to during the year. You should aim to check the website every few days for new postings. The website will contain the following.

- The *Study Planner*, which provides a schedule for studying SMT359.
- Latest news about SMT359.
- Any important errata for the SMT359 materials and assignments.
- Information about e-tutorial scheduling and topics.
- The e-text versions of the books.
- Additional exercises and solutions for each book.
- The assignment booklets.
- Access to the eTMA and iCMA systems.
- The *Glossary*.
- Additional resources to help your understanding, including screencasts.

# 5 Tuition

Tuition on SMT359 is organized through the Physical Science Student Support Team which operates across Level 3 physics and astronomy modules. The team will include tutors, pathway tutors, and curriculum staff. See the table on page 10 for details of how to contact the team.



You will be allocated a module tutor who will mark your TMAs and will be able to provide help with SMT359 during the year. We advise you to talk to your tutor very early in the year. He or she may be able to put you in contact with other SMT359 students, with whom you could form a self-help group. *You should not hesitate to contact your tutor about any academic question that you have relating to SMT359.* You will also be assigned a pathway tutor who has responsibility for guiding your progress through and beyond SMT359, as you study further with the OU. In addition you may be contacted by, or may need to contact, other members of the Physical Science Student Support Team who have responsibility for particular aspects of SMT359's presentation.

All of the tuition will be provided electronically. The e-tutorials will all be run using the Elluminate system, which allows synchronous communication of images, whiteboard writing, text and sound between tutors and groups of students. A typical tutorial might include a short lecture and present the step-by-step solution of a problem, followed by an opportunity for questions and discussion. Details of the timing of these tutorials, which will be open to all SMT359 students, will be posted on the website. Individual tutorials may be repeated if there is sufficient demand. With the permission of participants, these sessions may be recorded so that they can be viewed at a later date.

Your tutor may also arrange Elluminate sessions to provide direct help with specific topics, either for you individually or with a few other students. Such sessions could be highly beneficial, as clearing up early misconceptions and difficulties will make the rest of SMT359 much easier to study. These sessions will not be recorded. Your tutor should be able to offer highly-relevant *timely* support if you keep up-to-date with the iCMAs, working to the recommended completion deadlines given on the *Study Planner*.

To participate in Elluminate sessions, you will need an internet connection and a computer with speakers or headphones. A microphone is also required if you wish to communicate with the tutor and other participants via speech. Whilst it is possible to interact without a microphone (by using typed text) you will probably get more from Elluminate tutorials by using a combined headphone-microphone headset. This is particularly advisable if you want to take advantage of individual or small-group help sessions on particular topics. A combined headphone-microphone headset helps to avoid audio feedback problems and costs a few pounds.

There will be SMT359 forums which you can use to ask questions or discuss aspects of the module with other students. One advantage of sending questions to the forums is that members of the Physical Science Student Support Team will regularly drop in, read the messages and provide answers where appropriate.

## 6 Assessment

The continuous assessment consists of six interactive computer-marked assignments (iCMAs 51–56) and four tutor-marked assignments (TMAs 01–04). At the end of the module, there will be a three-hour written exam. All the continuous assignments are formative in the sense that your final grade will be determined solely by your exam mark, provided that your engagement with the continuous assessment has met certain threshold standards. In rare cases at the pass–fail borderline the Examination and Assessment Board may exercise favourable discretion if your continuous assessment performance is particularly strong.

To be eligible for a passing grade, you must engage satisfactorily with *at least seven* of the ten assignments, *at least two* of which must be TMAs. The threshold for satisfactory engagement is not high. If you score 30% or more on any assignment (iCMA or TMA), you will automatically be judged to have engaged satisfactorily with it. You will have many opportunities to repeat the iCMAs in order to boost your scores. However, you should certainly *not* treat the minimum threshold for continuous assessment as your target. The assignments are carefully designed to be a central part of your learning. You are strongly advised to complete as many of them as possible, and to aim for marks that are much higher than the minimum threshold of 30%. This is very important if you are to be adequately prepared for the final exam. We know from many years of experience that there is a close correlation between performance in continuous assessment and in the exam. By getting high marks on the continuous assessment, you will be doing the work needed to get a high exam mark, and you will be getting invaluable feedback which will help you improve your performance.

In summary, to obtain a credit in SMT359, you must have demonstrated satisfactory engagement with the continuous assessment (as specified above) and you must pass the final exam. The grade you obtain will then be determined solely by your exam mark. It is advantageous to do as many assignments as possible.

## 6.1 The iCMAs

The iCMAs are all accessible from the SMT359 website.

**The iCMAs will NOT be sent to you in the post.**

The iCMAs cover some of the most important topics and skills in SMT359. They have the great advantage of giving you instant feedback and hints, so if you get an answer wrong at your first or second attempt, you will be guided towards getting it right. Even if you get an answer wrong on your final attempt, you will be able to try a similar question on the same topic, and continue in this way until you are successful. If you still have difficulties, your tutor may be able to organize an individual or small-group Elluminate session to give help on a specific topic.

Because of their built-in hints and the possibility of multiple attempts, you should aim to get high scores in the iCMAs – preferably above 70%. If you do not achieve this to begin with, you should have another go at the assignment, trying for a higher mark. This iterative approach should guarantee that you have understood most of the key concepts and techniques of electromagnetism, and will mean that you are in a very good position to perform well in the exam. In fact, some of the questions in the iCMAs will be very similar in type to those in the exam, so there is even more motivation for getting them right!

The six core iCMAs (iCMA51–iCMA56) all count towards the continuous assessment threshold. These assignments are regularly paced throughout the module, with two for each of the three books. Each iCMA has a recommended completion deadline a week or so after the end of the relevant study period. This is to help pace your study through the module and to allow your tutor to give support when it is most needed. You may wish to tackle questions whilst you are studying each chapter, completing the whole assignment over a period of a few weeks, or you may tackle the assignment all in one go. *Whichever method you choose, we strongly recommend that you complete the iCMA by its recommended completion deadline.*

The core iCMAs are available throughout the module, and it is possible to tackle them after their recommended completion deadlines. For the purpose of deciding whether you have met the formal continuous assessment threshold, all six core iCMAs have the same formal cut-off date close to the end of the module (see the *Study Planner* for more details). On this date, your best score on each iCMA will be recorded and will be made available to the Examination and Assessment Board. Nevertheless, as already said, we strongly advise you to stick as closely as possible to the recommended completion dates. In previous years, a few students have delayed tackling the iCMAs, perhaps with the intention of trying them closer to the exam. This is a very bad plan. There will be additional Revision Medley iCMAs to help prepare for the exam, but the iCMAs 51–56 are designed to be an integral part of your studies, to be used regularly as you read the main texts. These iCMAs will help you gain the skills you need to tackle TMA questions, and completing them on time will ease your study of later chapters.

In addition to the core iCMAs, there are additional iCMAs which do not count towards the continuous assessment threshold. At the start of SMT359, iCMA Maths is an assignment that we expect all students to complete because it focuses on the key mathematical skills needed in Book 1. It is extremely important to attempt this iCMA as soon as possible, so that you can identify any areas you need to review. If you have specific difficulties, and can identify them early enough, the Physical Science Student Support Team will try to provide targeted help, and this could be invaluable. Also, at the end of the module, we will release medleys of iCMA questions based on the core iCMAs. These are designed to help you to revise before the exam.

## 6.2 TMAs

There are four short tutor-marked assignments (TMAs), which will be available to download from the SMT359 website at appropriate times during the module.

**The TMAs will NOT be sent to you in the post.**

Each TMA covers a different part of the module, as follows.

TMA 01 mainly relates to Book 1, Chapters 1–4.

TMA 02 mainly relates to Book 2, Chapters 1–4.

TMA 03 mainly relates to Book 2, Chapters 5–10.

TMA 04 mainly relates to Book 3, Chapters 1–5.

You should note that although Chapters 6 and 7 of Book 3 are not assessed by a TMA, they are assessed by an iCMA and **they may be assessed in the exam**.

The TMA questions focus on key parts of SMT359 and cover many of the skills you will need in the second half of the exam. They are designed to assess whether you have achieved the learning outcomes for the module, which are summarized in Section 6.5 below. Tackling the assignment questions is an important part of the learning process, since they will often require you to synthesize information from a number of areas, and to apply your knowledge and understanding in new ways. The TMAs will also help you to identify your strengths and the parts of the module that you need to spend more time on or that you need help with. The comments and feedback that you receive from your tutor will also contribute to your learning, and we strongly recommend that you look carefully at the advice that you receive. Screencasts giving further guidance on answering the TMA questions will be available on the website a few weeks after the TMA cut-off dates.

Each TMA has a fixed cut-off date about a fortnight after the relevant study period. Note that this is different from the situation with iCMAs. Unless you have good reasons for an extension, and have the agreement of your tutor, you will not be able to submit TMAs after the cut-off date specified in the *Study Planner*. At least two TMAs must be submitted to satisfy the continuous assessment threshold.

You are normally expected to submit all your TMAs electronically, using the on-line eTMA system. You can submit a word-processed document, or a scanned version of a hand-written one; advice on how to produce an eTMA will be provided on the SMT359 website. The eTMA system allows for TMA submission directly to the University 24 hours a day, and either gives you confirmation that your eTMA has been submitted successfully or, if there has been a problem, an error message informing you of the problem and what steps you should take to overcome it.

To submit your TMAs electronically you will need to:

1. Log on to StudentHome.
2. Click on the ‘assessment’ link under the relevant module on your StudentHome page.
3. Click on the ‘submit’ link alongside the TMA you want to submit and follow on the onscreen instructions.

General information about policy and procedure can be found in the *Assessment Handbook* which you can access from your StudentHome page.

Under certain circumstances, you can ask your tutor whether paper submission of your TMA will be acceptable. These circumstances could be, for example, your experience that typesetting equations electronically, or incorporating scanned images in your electronic document, would take you an unacceptably long time; or it might be that your computer is temporarily out of use. **Please note that, before submitting a TMA on paper, you must contact your tutor and obtain his/her agreement.**

If your tutor agrees to you submitting by post, you should be sure to post your TMA in sufficient time to arrive by the cut-off date. Do not send it using recorded delivery or guaranteed delivery; this can cause problems for tutors who are not at home to receive it. Instead, send it by first class post and ask for a proof-of-posting certificate at the post office and be sure to keep a copy of the assignment. If, for any reason, you are unable to complete your TMA on time, you must contact your tutor before the cut-off date to discuss possible options. Under exceptional circumstances your tutor may allow an extension, but this will be of limited duration (no more than three weeks). The procedure for late submission of assignments is given in your Assessment Handbook.

## 6.3 Examination

The three-hour written examination will be held in October. A *Specimen Examination Paper (SEP)*, with *Solutions*, will be made available on the website. Details of the examination date and your examination centre will also be sent to you during the year. Use of a scientific calculator is allowed in the examination, but the calculator must not be programmable and must not be able to store text.

**Memorizing equations?** You will discover that there are many important equations in electromagnetism. However, although it is often helpful to be able to recall these equations, we do not require you to remember them, and we do not want the examination to be a memory test. Included with the *SEP* will be an *Equations booklet* that you might need to use in the examination, and the same booklet will be attached to the final examination paper. This means that you need to understand the meaning of these equations, and be able to recognize them and know when to use them, but you do not need to commit them to memory. We recommend that you use the equation list when you tackle revision questions, such as those on the *SEP*, so that you will immediately know where to find what you need in the final exam.

## 6.4 Plagiarism

Plagiarism is using the work of other people to gain some form of benefit without formally acknowledging that the work came from someone else. For further information and advice on what constitutes good academic practice (and hence how to avoid plagiarism) please go to the *Developing good academic practice* website at <http://learn.open.ac.uk/site/dgap001/>. To check that all students are working in a fair and appropriate manner, the Open University is currently using test-comparison software to detect potential cases of plagiarism in work that is submitted for assessment. Details of how this is implemented in this module are given on the SMT359 website.

## 6.5 Learning outcomes

SMT359 provides opportunities for you to develop and demonstrate knowledge and understanding, qualities, skills and other attributes in the following four areas.

### Knowledge and understanding of

1. underlying concepts, principles, laws, equations, relationships and applications of electromagnetism;
2. terms, conventions and units of measurement appropriate to electromagnetism;
3. the language and the techniques of mathematics that are used in electromagnetism;
4. techniques for solving problems in electromagnetism;
5. how electromagnetic theory can be applied to a variety of situations;
6. the central role of Maxwell's equations and the Lorentz force law, and how they are used to make quantitative predictions and solve problems;
7. some of the limits of current knowledge in the field of electromagnetism.

### Cognitive skills You will be able to

1. use and apply knowledge and understanding of essential facts, concepts, principles and laws of electromagnetism to model a range of physical systems and to solve a variety of problems, in both familiar and unfamiliar situations;
2. use mathematical language and techniques, and mathematical and physical models, to understand phenomena and solve problems in electromagnetism; in particular, exploit symmetry to tackle three-dimensional problems, choose appropriate approximations that lead to tractable solutions to problems, and visualize complex three-dimensional situations, for example, by the construction, or interpretation, of appropriately labelled diagrams;
3. evaluate information from a range of sources and make sound judgements, which take account of theories and concepts of electromagnetism.

### Professional skill You will be able to

1. manage your own learning and time, and be able to learn independently so that you can continue your personal and professional development after completing the module.



**Key skills** You will be able to

1. locate, receive and respond to a variety of information sources (e.g. textual, numerical, graphical, video and computer-based);
2. communicate scientific information accurately and effectively, using appropriate combinations of written text, symbols, equations and numbers, graphs and diagrams, in a style that is suitable for the purpose and for the audience; communication may be in the form of a scientific essay, a shorter piece of writing, or appropriately presented solutions to problems, and must make correct use of scientific and mathematical notation;
3. perform complex calculations, with appropriate use of physical units;
4. improve your own learning and future performance by reflecting on past performance.

## 7 General advice

The *Study Planner* on the SMT359 website is an important tool because it provides a schedule for studying the module. It indicates which chapter you should be studying in a particular week. It also indicates any DVD activities scheduled for the week and shows when assignments are due. We strongly recommend that you stick as closely as possible to this schedule, moving on to each new chapter as indicated to avoid cumulatively slipping behind. If you do find yourself slipping behind, you should contact your tutor to discuss strategies for catching up.

You should regard the iCMA recommended completion deadlines and the TMA cut-off dates as key deadlines. You may wish to tackle each question immediately after studying the part of the module to which it relates, rather than tackling all of the questions at once. Note that there are four ‘consolidation weeks’ built into the schedule, which should help you to submit the assignments on time.

**Feedback to the SMT359 Team** We welcome your comments about SMT359, whether positive or negative. In particular, although we have a fairly robust system of checking and quality assurance for the module materials, some errors may slip through. So if you notice any mistakes in SMT359 (for example, misprints that make nonsense of an important sentence or an assignment question) which you think need correcting as soon as possible, please contact the SMT359 Curriculum Manager. Please don’t assume someone else has done so.

## 8 Other books on electromagnetism

The SMT359 materials are designed to provide the information and develop the skills required to achieve the module learning outcomes (Section 6.5). However, there may be occasions when you wish to consult other books, either for an alternative viewpoint on topics that are part of the module, or to find out about electromagnetism topics that are not included in the module, or even to see a more advanced treatment of some topics. The books listed below are those that we would recommend. Note that there is quite a lot of variation in the notation used in different electromagnetism books, and this can be confusing.

### Books at about the same level as SMT359

- W. J. Duffin, *Electricity and magnetism*, 4th edn (McGraw-Hill, 1990) ISBN 0 07 707209 X
- I. S. Grant and W. R. Phillips, *Electromagnetism*, 2nd edn (Wiley, 1990) ISBN 0 471 92712 0
- D. J. Griffiths, *Introduction to electrodynamics*, 3rd edn (Prentice-Hall, 1999) ISBN 0 13 805326 X
- P. Lorrain, D. R. Corson and F. Lorrain, *Fundamentals of electromagnetic phenomena* (Freeman, 2000) ISBN 0 7167 3568 7

### For helpful insights into many important topics

- E. M. Purcell, *Electricity and magnetism*, 2nd edn (McGraw-Hill, 1985) ISBN 0 07 004908 4 (This book does not use SI units.)
- R. P. Feynman, R. B. Leighton and M. Sands, *The Feynman Lectures on physics*, Volume 2 (Addison Wesley, 1971) ISBN 0 201 02117 X

### More advanced textbooks

- J. D. Jackson, *Classical electrodynamics*, 3rd edn (Wiley, 1999) ISBN 0 471 30932 X
- P. Lorrain, D. R. Corson and F. Lorrain, *Electromagnetic fields and waves*, 3rd edn (Freeman, 1988) ISBN 0 7167 1869 3

## 9 Whom should you contact if you have queries or problems?

The table below gives a list of useful contacts if you have difficulties or queries relating to your studies.

Your StudentHome page at <http://www.open.ac.uk/students> also provides many points of contact.

If you have queries or problems relating to:	Whom to contact:
Academic aspects of SMT359; clarification and/or help with the module materials; queries about TMAs or iCMAs.	Your tutor. Contact details are on StudentHome.
Non-receipt of a marked TMA.	First contact your tutor, then if necessary the Physical Science Student Support Team Email: <a href="mailto:physical-science-support@open.ac.uk">physical-science-support@open.ac.uk</a> Telephone: +44 (0)845 366 0474  Otherwise, to contact the OU: Telephone: +44 (0)1908 654146 Write to: Assignment Handling Office The Open University, PO Box 722 Milton Keynes MK7 6ZT
Problems contacting your tutor or anything related to tutor support.	The Physical Science Student Support Team Email: <a href="mailto:physical-science-support@open.ac.uk">physical-science-support@open.ac.uk</a> Telephone: +44 (0)845 366 0474
Information about online tutorial dates and times.	The SMT359 website or the Physical Science Student Support Team Email: <a href="mailto:physical-science-support@open.ac.uk">physical-science-support@open.ac.uk</a> Telephone: +44 (0)845 366 0474
Non-receipt of, incomplete, or damaged materials, including CD-ROMS/DVDs; requests for replacement materials if you lose or damage items.	In StudentHome click on 'materials despatch' Telephone: +44 (0)1908 332633
Computing hardware and difficulties using software.	In StudentHome click on the 'Help' tab and then 'Computing support' Telephone: +44 (0)1908 653972
Obtaining copies of published articles, literature searches, searching the internet and using other Library resources.	In StudentHome go to 'Services' section and click on 'Library services' Telephone: +44 (0)1908 659001 Email: <a href="mailto:library-help@open.ac.uk">library-help@open.ac.uk</a> Website: <a href="http://www.open.ac.uk/library">www.open.ac.uk/library</a> Write to: Library services The Open University Walton Hall Milton Keynes MK7 6AA

If you have queries or problems relating to:	Whom to contact:
Advice for students with disabilities.	<p>In StudentHome go to 'Services' section and click on 'Services for disabled students'</p> <p>Telephone: +44 (0)1908 653745</p> <p>Textphone: +44 (0)1908 655978</p> <p>Email: Disabled-student-resources@open.ac.uk</p> <p>Website: <a href="http://www.open.ac.uk/disability">www.open.ac.uk/disability</a></p> <p>Write to:</p> <p>The Learner Support Team at your Regional Centre or</p> <p>Disabled Students Resource Team</p> <p>The Open University</p> <p>Hammerwood Gate</p> <p>Kents Hill</p> <p>Milton Keynes MK7 6BY</p>
Module registration.	<p>In StudentHome click on the 'Help' tab</p> <p>Telephone: +44 (0)845 300 6090</p> <p>Email: <a href="mailto:general-enquiries@open.ac.uk">general-enquiries@open.ac.uk</a></p> <p>Write to:</p> <p>The Learner Support Team at your Regional Centre or Student Registration and Enquiry Service</p> <p>The Open University</p> <p>PO Box 197</p> <p>Milton Keynes MK7 6BJ</p>
Study choice and degree pathway planning.	<p>The Physical Science Student Support Team</p> <p>Telephone: +44 (0)845 366 0474</p> <p>Email: <a href="mailto:physical-science-support@open.ac.uk">physical-science-support@open.ac.uk</a></p>
All other queries including: study issues, withdrawal from the module, change of name or address.	<p>The Physical Science Student Support Team</p> <p>Telephone: +44 (0)845 366 0474</p> <p>Email: <a href="mailto:physical-science-support@open.ac.uk">physical-science-support@open.ac.uk</a></p>
Comments on the module itself or on the assignments (e.g. suspected errors, suggestions for improvements).	<p>The SMT359 Curriculum Manager</p> <p>Department of Physics and Astronomy</p> <p>The Open University</p> <p>Milton Keynes MK7 6AA</p> <p>E-mail: <a href="mailto:OU-Science@open.ac.uk">OU-Science@open.ac.uk</a></p> <p>(Please quote the module code, SMT359, in the subject field.)</p>

